

CASE OF TETANY OF FIVE YEARS' DURATION.

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A. C., aged 39, through the kindness of Dr. McConnell, consulted me about two months ago, complaining of diarrhoea and "spasms of the face, arms and legs." His diarrhoea began seven years ago, and has been more or less constant ever since. The spasms of the muscles of the limbs and face, which are of an intermittent character, first troubled him about five years ago. During the late American civil war he served as a private soldier throughout many of the Virginia campaigns. He had three attacks of malarial fever, and for eighteen months suffered from chronic dysentery; and it was not until he moved to the Western States, after the termination of the war, that he completely recovered from it. He never had either syphilis or rheumatism; never drank to excess; worked at his trade (stone-mason) until eighteen months ago, until he was no longer able on account of gradually-increasing general weakness and the stiffness of the muscles of his hands. In 1863 he received a severe scalp wound from a sabre, which healed in a short time. The family history is unimportant.

Patient is tall, emaciated and anæmic, with an anxious and careworn expression. About once a month the muscles of his fingers, hands and arms become the seat of tonic contractions, which generally last from ten to twelve days. The thumbs become

adducted and opposed, while the fingers are adducted and semi-flexed. The contractions come at times suddenly, but usually are slow in making their appearance, and gradually increase in severity day by day up to the tenth or twelfth day, when they suddenly begin to decline, the parts becoming normal in about twenty-four hours. When the spasms are what he calls severe, the adductors of the upper arms become involved, bringing the arms crossed in front of the body, the forearms being usually semi-flexed. For some hours before, and during the whole time that the tetany is present he has a disagreeable feeling of numbness in his fingers. The dorsum of his hands swell and become very painful also during this period. The pain is especially severe when an attempt is made to move the contracted muscles. The muscles of the face are usually more or less contracted at the same time. He has a feeling as if the skin was too tightly drawn across his face. The facial muscles are also the seat of almost constant fibrillary twitchings. The muscles of the lower extremities are only occasionally the seat of spastic contractions; when they are, the feet and toes are in a state of plantar flexion, the feet being turned inwards and the thighs adducted. During the existence of tetany he has diplopia.

The electrical reactions of the nerves and muscles affected are enormously increased. During the past week, while he was suffering from one of his usual attacks, contraction of the facial muscles was induced on the application of galvanism to the facial nerve by a strength of current not exceeding .25 of a milliampère (measured by Edelmann's galvanometer), while at the present time, when his muscles are no longer rigid, the tetany having passed away, it takes 3 milliampères to produce a similar result. There is a corresponding difference in the reactions of the radial, ulnar and median nerves:

	<i>Normal period.</i>	<i>Tetany period.</i>
Facial.....	3.0 milliampères.	.25 milliampères.
Radial	5.00	1.00
Median	4.25	.50
Ulnar	3.50	.50

Since coming under observation, the two attacks which he has suffered from have not been attended by contraction of the

muscles of the lower extremities. On this account their electrical reactions have not been ascertained. Five milliampères is sufficient to produce tetanic contraction on the shutting of the kathode (K S Te) and on opening the anode (A O Te). There is no change in the normal formula, the $K S Z < A O Z$. The difference in the reactions of the nerves and muscles to the induced current during the tetany and after it has passed away is not marked. In fact, the interossei require a much stronger current to produce their contraction during the tetany state than during the normal condition. This is plainly owing to the œdema of the hands during the attacks, the œdematous tissues greatly increasing the resistance. The muscles, although flabby, are in a fairly nourished condition. The patellar reflexes are greatly exaggerated during the period of tetany, while after it has passed away it is frequently impossible to produce any contraction of the quadriceps when the patellar tendons are struck. The triceps and biceps reflexes are exaggerated during the tetany period, and absent after the muscles have become normal. No ankle clonus at either period. There is nothing definite to be made out in regard to the superficial and organic reflexes.

The tongue is constantly in a raw-looking state. The appetite, however, is usually fair. He is seldom free from diarrhoea, the average number of stools in the twenty-four hours being usually about six; only very seldom is there one stool in the day. The diarrhoea always moderates when the tetany makes its appearance. The abdomen is constantly distended; stools are large, frothy, semi-fluid, and look like pea-soup. The urine is acid, but normal in quantity, specific gravity 1030; contains great excess of both urea and indican, but is free from albumen and sugar. At times he becomes deeply jaundiced. There is no further evidence, however, physical or subjective, of disease of the liver. The apex of the heart is in the normal position. There is no increase in the cardiac dulness, neither is there any other evidence of cardiac disease. Nothing abnormal in the respiratory system. There is no relative increase in the number of the white-blood cells; the red appear to be normal. There is no enlargement of the spleen.

Remarks.—We have here to do with a case of chronic diarrhoea of some seven years standing, with intermittent tetany of five years' duration. Tetany is a disease which has been known for some years. First described in France by Corvisart, later and more fully by Trousseau, but it is to Weiss and Chovstok of Vienna and Erb of Heidelberg that we are indebted, in the main, for our present knowledge of it. There are three apparently distinct forms of this disease, forms which differ much in the causes which give them origin and in their prognosis, but little in the clinical pictures which they present. By far the most variety common of this disease is known as "rheumatic" or epidemic tetany.

The second variety of tetany is more chronic, and is due to either chronic diarrhoea, prolonged lactation, or other debilitating influences. The third form follows operations for removal of enlarged thyroid glands.

Clinically, these varieties differ somewhat. The so-called rheumatic form being essentially an acute affection, coming on suddenly and terminating usually inside of two weeks, the spastic periods of a few hours' duration intermitting with normal periods. Recovery nearly always occurs. The chronic form, due to debilitating agencies, differs little from the acute form, except in duration. Recovery in these cases nearly always occur also. The so-called surgical variety of the disease generally makes its appearance about a week after extirpation of enlarged thyroid glands, and especially when the subject has been a young female. Many of these prove fatal within a few days, while a number become permanently chronic. Early and complete recovery is very exceptional.

Judging from published observations, tetany is an extremely rare disease on this side of the Atlantic. In England it is equally rare. On the continent of Europe it is quite common, especially in France and Germany. This is true of all forms of the disease. In Vienna, not a winter passes without an epidemic of it, while cases of the chronic and surgical varieties are not at all rare. Up to May 1883, Billroth performed 78 operations for removal of goitres, 12 of which proved fatal, 6 of these

deaths being directly due to tetany. In all, there were 13 cases of tetany following the 78 operations, 6 of which ended fatally. Two of the fatal cases ran a course of upwards of one year, while the remaining four terminated within two weeks.

Pathology.—There is nothing definitely known. In the very few cases where a histological examination of the nervous structures has been obtained after death, no lesion to account for the symptoms present during life could be discovered.

I have in my possession sections of the cervical cord of a young girl who died from tetany two weeks after the removal of an enlarged thyroid gland, the only noticeable change being in the finely granular protoplasm of the ganglion cells of the anterior horns; the granules being considerably larger than they normally are. A few swollen ganglion cells are also noticeable. Simply saying that tetany is due to an exaggerated excitability of the spinal gray matter means nothing. How this excitability is induced remains unanswered. On the theory that the cerebellum is the centre for continuous movements, and the cerebrum for changing movements, Dr. Hughlings-Jackson has advanced the proposition that the phenomena of tetany are best explained by defective antagonism of cerebellar influences. That during the tetanic period the cerebral influences are removed.

To explain how causes, seemingly so diverse in their operation, as "rheumatic influences," diarrhoea, lactation, and operative interferences on the thyroid glands, can induce similar symptoms is very difficult. At one time it was thought that those cases following thyroid removals were due to injury of the recurrent laryngeal nerve during the operation. Cases of tetany, however, follow this operation, no matter what care may be taken in avoiding this nerve; it is therefore fair to conclude that there is no direct causative connection, especially when we take into account the fact that irritation of the recurrent laryngeal nerve from the pressure of tumors does not induce this disease. The active cause in the case reported is undoubtedly the diarrhoea, but whether induced by the direct impoverishment of the nerve centres, or through the constant peripheral (intestinal) irritation, it is impossible to say. The late N. Weiss of Vienna considered

peripheral irritation to be the cause of the disease. He believed that this gave rise to alternate waves of vessel dilatation and contraction. During the former state we have, according to this assumption, the tetany period, while during the latter the muscles return to their normal condition. This theory might possibly explain cases like the one under observation and those following goitre removals, but it could not apply to the "rheumatic cases."

Treatment.—No medicinal agent has any power in absolutely preventing or diminishing tetany. Billroth speaks favorably of the application of ice to the cervical spine. Erb, Chovstok and Weiss look upon galvanism as the only agent of any real value. Erb believes that it considerably shortens and ameliorates the attacks. He recommends the K A to be applied to the sternum while the A N is to be applied to the diseased parts in succession, including the muscles, main nerve trunks, and the cervical portion of the spinal cord. Since this patient was exhibited to the society, an attack was apparently averted by galvanization of the radial nerves.

